CLAIMS

What is claimed is:

1. A method for generating a three-dimensional image, comprising:

moving an X-ray source along a spiral scan trajectory;

acquiring projection data at a plurality of locations on the spiral scan trajectory, wherein projection data generated from different heights relative to a detector surface conveys greater depth information than projection data acquired along a two-dimensional trajectory; and

generating a three-dimensional image from the projection data.

2. The method, as recited in claim 1, wherein the X-ray source is configured to move continuously along the spiral scan trajectory.

3. The method, as recited in claim 1, wherein the X-ray source is configured to move discontinuously along the spiral scan trajectory.

4. The method, as recited in claim 1, wherein the spiral scan trajectory comprises one of a spiral trajectory, a composite trajectory, a multi-planar-trajectory, and an arbitrary trajectory.

5. The method, as recited in claim 1, comprising:

selecting the spiral scan trajectory based on a desired dosage for a region of interest.

6. The method, as recited in claim 1, comprising:

adjusting an operating characteristic of the X-ray source based on the location on the spiral scan trajectory.

7. The method, as recited in claim 1, comprising:

selecting a spiral scan trajectory based upon a two-dimensional trajectory having one or more desired characteristics.

8. A computer program, provided on one or more computer readable media, for generating a three-dimensional image, comprising:

a routine for moving an X-ray source along a spiral scan trajectory;

a routine for acquiring projection data at a plurality of locations on the spiral scan trajectory, wherein projection data generated from different heights relative to a detector surface conveys greater depth information than projection data acquired along a two-dimensional trajectory; and

a routine for generating a three-dimensional image from the projection data.

9. The computer program, as recited in claim 8, wherein the routine for moving the X-ray source moves the X-ray source continuously along the spiral scan trajectory.

10. The computer program, as recited in claim 8, wherein the routine for moving the X-ray source moves the X-ray source discontinuously along the spiral scan trajectory.

11. The computer program, as recited in claim 8, wherein the spiral scan trajectory comprises one of a spiral trajectory, a composite trajectory, a multi-planar-trajectory, and an arbitrary trajectory.

12. The computer program, as recited in claim 8, comprising:

a routine for selecting the spiral scan trajectory based on a desired dosage for a region of interest.

13. The computer program, as recited in claim 8, comprising:

a routine for adjusting an operating characteristic of the X-ray source based on the location on the spiral scan trajectory.

14. The computer program, as recited in claim 8, comprising:

a routine for selecting a spiral scan trajectory based upon a two-dimensional trajectory having one or more desired characteristics.

15. A tomosynthesis imaging system, comprising:

means for moving an X-ray source along a spiral scan trajectory;

means for acquiring projection data at a plurality of locations on the spiral scan trajectory, wherein projection data generated from different heights relative to a detector surface conveys greater depth information than projection data acquired along two-dimensional trajectory; and

means for generating a three-dimensional image from the projection data.

16. A tomosynthesis imaging system, comprising:

an X-ray source configured to emit a stream of radiation through a volume of interest at a plurality of locations along a spiral scan trajectory;

a detector array comprising a plurality of detector elements, wherein each detector element may generate one or more signals in response to the respective streams of radiation and wherein the one or more signals generated in response to streams of radiation emitted at different heights relative to the detector convey greater depth information than projection data acquired along a two-dimensional trajectory;

a system controller configured to control the X-ray source and to acquire the one or more signals from the plurality of detector elements;

a computer system configured to receive the one or more signals and to generate a three-dimensional image from the one or more signals; and

an operator workstation configured to display the rendered image.

17. The tomosynthesis imaging system, as recited in claim 16, wherein the X-ray source is configured to move continuously along the spiral scan trajectory.

18. The tomosynthesis imaging system, as recited in claim 16, wherein the X-ray source is configured to move discontinuously along the spiral scan trajectory.

19. The tomosynthesis imaging system, as recited in claim 16, wherein the spiral scan trajectory comprises one of a spiral trajectory, a composite trajectory, a multi-planar-trajectory, and an arbitrary trajectory.

20. The tomosynthesis imaging system, as recited in claim 16, wherein an operating characteristic of the X-ray source is adjusted based on the location of the X-ray source on the spiral scan trajectory.